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PACKET CLASSIFICATION USING HASH KEY SIGNATURES GENERATED FROM INTERRUPTED HASH FUNCTION

ABSTRACT OF THE DISCLOSURE

A network switch, configured for performing layer 2 and layer 3 switching in an Ethernet (IEEE 802.3) network without blocking of incoming data packets, includes network switch ports, each including a packet classifier module configured for generating a packet signature based on information within a received data packet and hash action values specified within a user-programmable template. In particular, the network switch stores a plurality of user-programmable templates, each configured for identifying a corresponding class of data packet. Each user-programmable template includes hash action values specifying initiation and termination of a hash function based on a byte offset of a received data packet. The packet classifier module includes a hash generator configured for generating hash values for selected bytes of the received data packet, and a template translator configured for controlling the hash generator for hashing the selected bytes of the received data packet based on the hash action values specified by a corresponding user-programmable template. Hence, a unique hash signature can be generated by supplying a data frame having a prescribed data values at the selected bytes of the user-programmable template; the hash signature can then be stored for comparison with incoming data packets during network switching operations. Hence, data packets can be classified at the wire rate by performing a hash-based search of selected bytes of the received data packet.